

**STATEMENT OF WORK
FOR
MANIFOLD BLOCK ASSEMBLIES
FOR
SWING ARM HYDRAULIC SYSTEM**

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Reference EDDR 1312020, NASA KSC Export Control Office (321-867-9209)

August 6, 2013

ENGINEERING AND TECHNOLOGY DIRECTORATE

National Aeronautics and
Space Administration

John F. Kennedy Space Center



STATEMENT OF WORK

MANIFOLD BLOCK ASSEMBLIES

FOR

SWING ARM HYDRAULIC SYSTEM

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RECORD OF REVISIONS		
REV LTR	DESCRIPTION	DATE
-	Basic Issue	June 26, 2013
A	Document revised to include input from NASA Procurement	August 2, 2013

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This document provides the requirements for the procurement of four (4) Swing Arm Hydraulic Speed Control Manifolds (KT00335) and four (4) Swing Arm Hydraulic Pressure Reduction Manifolds (KT00336).

1.2 Scope

This Statement of Work (SOW) defines the effort for the design, fabrication, testing, transportation, and acceptance of a Manifold Assemblies per Procurement Specification K0000143202-SPC Manifold Block Assemblies for Swing Arm Hydraulics System.

2.0 REQUIREMENTS

The Contractor shall meet the following requirements contained in this SOW and the technical Procurement Specification (K0000143202-SPC) for the performance of this procurement.

The contractor shall manufacture, verify, and deliver the Manifold Assemblies per this contract. The requirements for performance and physical characteristics, interchangeability, design and fabrication, qualification and acceptance testing, and transportation are provided in Procurement Specification K0000143202-SPC.

The Manifold Assemblies shall be identified based on the following:

KSC Part Number	Program Model Number	Serial Number	Description	Quantity	Delivery Date (no later than)
KT00335-001, -002, -003, -004	GM-K-00031-01	001 (each dash number)	Speed Control Manifold Assembly	4	150 days after Contract Award
KT00336-001, -002, -003, -004	GM-K-00030-01	001 (each dash number)	Pressure Reduction Manifold Assembly	4	150 days after Contract Award

The following assembly components shall be provided as spare parts:

Table 1 – Recommended List of Components - with Delivery Date (See Procurement Specification K0000143202-SPC Paragraph 3.6).

Vendor	Part Number	Description	Quantity	Delivery Date (no later than)
ATOS	LIDASH-32433/FV/ERX-28DC with BKS-S20-4-PU-5 Connector	Isolation Valve with Position Indication	1	150 days after Contract Award
ATOS	LIQZO-LE-252L4/I with SP-ZM-7P Connector	Proportional Throttle Valve	1	150 days after Contract Award
ATOS	LIDA-3 Cover & SCLI-32421 Cartridge	Check Valve, Main Flow	1	150 days after Contract Award
ATOS	LIMM-3/50/V Cover & SCLI-32312 Cartridge (90 psi Set Pressure)	Relief Valve, Low Pressure	1	150 days after Contract Award
ATOS	LIMM-3/350/V Cover & SCLI-32312 Cartridge (3000 psi Set Pressure)	Relief Valve, High Pressure	1	150 days after Contract Award
Sun Hydraulics	CXAA-XBN	Check Valve, Pilot Pressure	1	150 days after Contract Award
Sun Hydraulics	NFDC-LAN	Manual Needle Bypass Valve	1	150 days after Contract Award
ATOS	LIDASH-16433/FV/ERX-28DC with BKS-S20-4-PU-5 Connector	Isolation Valve with Position Indication	1	150 days after Contract Award
ATOS	LIDA-1 Cover & SCLI-16322 Cartridge	Check Valve	1	150 days after Contract Award
ATOS	LIRA-1/210 Cover & SCLI-16374 Cartridge	Regulator, High Pressure	1	150 days after Contract Award

Vendor	Part Number	Description	Quantity	Delivery Date (no later than)
ATOS	LIRA-1/50 Cover & SCLI-16374 Cartridge	Regulator, Low Pressure	1	150 days after Contract Award
DMIC Ball Valves	BVMM-1000- 2211-PZZZ	Ball Valve, Manual Isolation	1	150 days after Contract Award

2.1 Applicable Documents

The following documents are applicable to this SOW:

Document Number	Revision Number	Description
K0000143202-SPC	A	Procurement Specification for Manifold Block Assemblies for Swing Arm Hydraulic System.
KDP-P-5042	Basic	Acceptance Data Package (ADP) Process Document
KDP-F-5042 A-K	Basic	Acceptance Data Package (ADP) Forms
ASME B31.3	2012	Process Piping
ANSI/ISO/ASQ 9001	2008	American National Standard Quality Management Systems Requirements
ANSI/ISO/ASQ Q10012	First Edition	Measurement Management Systems - Requirements for Measurement Processes and Measuring Equipment

2.2 Precedence

If any of the documents invoked herein are changed during the period of performance of the Contract/Purchase Order, the Contractor shall not use the later issue without prior written approval of the NASA Contracting Officer.

2.3 Component (Qualified)

The Contractor shall utilize the list of components which meet the qualification requirements in the Procurement Specification K0000143202-SPC Section 4. Requests for use of substituted components of equal performance may be requested for approval to the NASA Contracting Officer. Qualified substitute components, to be provided in lieu of the listed component spares, will be incorporated by modification upon approval.

The contractor shall provide the NASA Contracting Officer any requests for approval of substitutes for review and approval at least ten (10) working days prior to release for fabrication and will not be a cause for an equitable adjustment in schedule.

2.4 General

The contractor shall provide manifold drawings (CDRL 001) and engineering analysis report (CDRL 002) as required by Procurement Specification K0000143202-SPC.

The Contractor shall provide drawings of both manifolds, Speed Control (KT00335) and Pressure Reduction (KT00336), twenty (20) working days after contract award. These drawings at a minimum shall show:

- 1) External dimensions - width, length and height
- 2) Dimensional locations of all fluid ports
- 3) Dimensional locations of mounting bolt holes
- 4) Dimensional location of lifting eye holes
- 5) Estimated weight, within +/- 5%, with all components attached

The contractor shall provide the NASA Contracting Officer any technical requirements and/or specifications (CDRL 003) for review and approval at least ten (10) working days prior to release for fabrication. Any technical requirements and/or specifications released to subcontractor prior to Government approval are at the sole risk of the contractor and may be subject to change.

The contractor shall fabricate and perform acceptance tests, cleaning, certification, shipment preparation, packaging and delivery of the Manifold Assemblies to KSC as defined in Procurement Specification K0000143202-SPC.

The Government has the right to inspect pursuant to the inspection clauses of the contract, any process at all places and times, including the period of manufacture (i.e., fabrication, assembly and testing), and in any event before acceptance.

2.5 Warranty

The Contractor shall provide a warranty (CDRL 004) that the manifolds shall be free from defects in material and workmanship or failure to conform to specifications, for a minimum of one (1) year. The warranty shall clearly state the—

- (1) Exact nature of the item and its components and characteristics that the contractor warrants;
- (2) Extent of the contractor's warranty including all of the contractor's obligations to the Government for breach of warranty;
- (3) Specific remedies available to the Government; and
- (4) Scope and that duration of the warranty is (1) year.

3.0 DATA MANAGEMENT

All data deliverables shall be delivered electronically in common computer formats such as Word, Excel, pdf and etc. unless otherwise specified. All engineering records – drawings, reports, calculations, etc shall be provided to the government in native file format as well as an image file such as pdf (portable document format) and two clean hard copies. All Contractor proprietary documents, such as shop practices/procedures, shall be appropriately marked on each individual page/sheet.

All documents provided to the Contractor that contain an Export Controlled data, or similar information sensitivity marking, shall have that marking maintained with that document and information at all times. Contractor created drawings or documents based on NASA supplied Export Controlled drawings or documents, shall carry-over that Export Control sensitivity marking, as the Export Control determination belongs with the information, not the drawing or document.

The Contractor shall submit all data deliverables electronically per Section 7.0. All documents shall be submitted in an electronic format that is searchable (e.g., pdf). For documents that were scanned, the Contractor shall run "paper capture" or optical character recognition to convert the file to a searchable format before submittal.

4.0 PROJECT SCHEDULE

The Contractor shall develop, maintain, and track a project schedule. The project schedule shall illustrate the schedule that the Contractor intends to follow over the period of performance. The project schedule (CDRL 005) shall be delivered to the NASA Contracting Officer ten (10) days after Contract award.

5.0 DOCUMENT CONTROL

The Contractor shall implement a Document Control as defined by their process meeting ANSI/ISO/ASQ Q9001-2008, compliance with higher-level quality standards for complex or critical items requirements.

5.1 Request for Change or Deviation/Waiver

All Contractor requests to deviate from the technical requirements in Procurement Specification K0000143202-SPC, shall present rationale for requested deviation and the impact of the deviation with respect to achieving the component's specification performance (along with cost adjustment— either additional or reduced price). The NASA Contracting Officer's approval shall be required for any Request for Change or Deviation / Waiver (CDRL 006). The Contractor shall utilize KSC Form 8-69 for all deviation or waiver requests. Deviation requests are to be submitted when the Contractor wishes to deviate from a requirement in drawings, specifications, or standards. Waiver requests are to be submitted when the Contractor is unable to meet a requirement in the drawings, specifications, or standards, and is requesting relief from that requirement. The Government shall hold final decision rights for the approval of deviation and waiver requests.

5.2 Change Management

The Contractor change process shall ensure that all design changes that affect development, fabrication, assembly, inspection, or testing shall go through a controlled process to ensure that the quality of the component and associated documents are not compromised.

5.3 Engineering Release

The Contractor shall establish an engineering release system in accordance with internal company procedures, to issue configuration documentation, to control functional activities and to authorize the use of configuration documentation associated with an approved configuration.

6.0 QUALITY ASSURANCE

6.1 Quality System

The contractor's quality system shall at a minimum be compliant to ANSI/ISO/ASQ 9001-2008.

6.2 Inspection Control Point Outline

Special inspections, called Mandatory Inspection Points (MIP), will be designated by the Government during the performance of this contract. At least ten (10) days prior to the start of fabrication, the Contractor shall provide the NASA Contracting Officer and Quality Assurance Representative a schedule and Inspection Control Point Outline (ICPO) (CDRL 007), which shows the work sequence(s) to be employed during the performance of this contract. The contractor's schedule/ICPO must indicate what types of contractor inspections will be performed and where in the contract's sequence of events they will be accomplished. If applicable, the schedule/ICPO must also indicate the specification(s) (including revisions) and/or other documentation that will be used to perform the indicated inspections.

6.3 Contamination Control

The Contractor shall develop and implement a Cleaning Procedure that meets the requirements in Procurement Specification K0000143202-SPC. The Cleaning Procedure (CDRL 008) shall be provided to the NASA Contracting Officer ten (10) work days prior to the cleaning process start. The procedure shall address as a minimum the following:

- A. Materials Selection – Materials shall be selected to preclude generating contaminants during operation.
- B. Cleaning and Surface Cleanliness – All materials shall be cleaned and verified clean to meet Procurement Specification K0000143202-SPC requirements. The Cleaning Procedure shall include required solvents and cleaning methods.

6.4 Calibration System

The Contractor shall have a documented calibration system that meets the requirements of ANSI/ISO/ASQ Q10012 Measurement Management Systems – Requirements for Measurement Processes and Measuring Equipment – First Edition, or equivalent standard(s).

6.5 Certificate of Conformance-Raw Materials

Contractor will include with each shipment the raw material manufacturer's test report (e.g., mill test report) (CDRL 009) that states that the lot of material furnished has been tested, inspected, and found to be in compliance with the applicable material specifications. The test report will list the specifications, including revision numbers or letters, to which the material has been tested and/or inspected and the identification of the material lot to which it applies.

When the material specification requires quantitative limits for chemical, mechanical, or physical properties, the test report will contain the actual test and/or inspection values obtained. For aluminum mill products (except castings), certifications for chemistry may indicate compliance within the allowed range.

Certifications for physical properties will show actual values.

6.6 Traceability - Raw Material

Supplier shall mark each individual item and applicable documentation (e.g. test report, shipping report, or certification) to show traceability to lot, heat lot, material control or batch number. Unless otherwise directed by this contract, engineering drawing or the specification, when the size of the item does not permit marking of individual items, Supplier shall label each package or box furnished. Lots shall not be mixed.

7.0 SUBMITTAL DOCUMENTS

The Contractor shall provide all of the data listed in Appendix A of this Statement of Work entitled "Contract Data Requirements List (CDRL)". All Contract data requirements shall be submitted to the NASA Contracting Officer as identified in the contract. All CDRL's shall be subject to the unilateral approval of the NASA Contracting Officer. In the event of disapproval, the Contractor shall initiate immediate corrective action and shall resubmit to the NASA Contracting Officer for approval within five (5) work days.

7.1 Acceptance Data Package (ADP)

The Contractor shall develop, maintain and deliver, for each manifold assembly, an Acceptance Data Package (CDRL 010). KDP-P-5042, Engineering and Technology Directorate Acceptance Data Package Process Document defines and specifies the minimum requirements. The Contractor shall complete all KDP-F-5042 documents provided by the Government and include them in ADP as specified in KDP-P-5042. The ADP shall be included with each shipment for the units or items shipped. The ADP shall include a cover page and a table of contents with each section linked to the cover page of that section, and shall be in text searchable format. An electronic copy of the ADP shall be delivered to the NASA Contracting Officer for review ten (10) days prior to hardware delivery. The ADP shall be subject to approval by the Contracting Officer, COTR, and Configuration Management (CM). In the event of disapproval, the Contractor shall initiate immediate corrective action and shall resubmit to the NASA Contracting Officer for approval, prior to shipping the Hardware.

An updated electronic and hard copy shall be included with the final manifold assembly shipment. Delivery will not be accepted by the Government without an accompanying ADP.

The ADP shall include the following in addition to the KDP-P-5042 minimum requirements:

- A. Certificate of Compliance shall be provided stating all the requirements in the Procurement Specification K0000143202-SPC and the SOW were met.
- B. Certificate of Compliance stating that the Manifolds and associated components meet ASME B31.3 requirements.
- C. Test history log, including post manufacturing checkout and final verification tests of the manifold assembly, with the following data (may refer to the Component Data Log for details):
 - 1. Actual measurements identified to specified tests. References made to applicable test reports are satisfactory, provided that copies of the reports are provided.
 - 2. Brief test summary.
 - 3. List of actual and recommended retest.
 - 4. Special test instructions, investigations, warnings, and problems encountered during test.
 - 5. Failure and corrective actions data for all failures during all testing.
- D. Each manifold assembly will have a data log which shall include the following:

1. Records for all metallic materials and shall include:
 - a. Material Listing – (Vendor certificate(s) acceptable)
 - b. Testing certificates – (Vendor certificate(s) acceptable)
 2. Acceptance Test Data:
 - a. Final Test Plan & Procedure(s)
 - b. Test Reports
 3. Contamination:
 - a. Finalized cleaning procedure
 - b. Results
 4. Dimensional check that includes measurements of the outside interface dimensions, to check conformity with Contractor generated drawings.
 5. Records showing any identified defects during inspection / testing with correction data. – Applicable to all the above tests and inspections.
 6. Analysis of acceptance test data
 7. Photographs and video of any acceptance testing films and x-rays (if applicable) shall be provided to NASA (digital quality).
- E. All analysis performed per Procurement Specification K0000143202-SPC to include stress and flow analysis.
- F. Complete copies of drawings reflecting AS-BUILT configuration to the level required to permit repair, maintenance and operation of the component.

8.0 DESIGN AND FABRICATION

The Contractor shall design and fabricate the manifold assemblies such that they meet all requirements detailed in the Procurement Specification K0000143202-SPC and this SOW. Acceptance testing shall be performed as part of the fabrication and assembly phase to assure compliance with the above specification.

8.1 Component Specifications

The contractor shall provide detailed technical component specifications (CDRL 011) for any subcontract piece or part of the manifold assemblies is required for NASA review at the Pre-fabrication design review. Associated components that are not designed per ASME B31.3 requirements, but are designed to some other standard, require approval from the NASA Contracting Officer, prior to the use of said components detailed in the Procurement Specification K0000143202-SPC. All associated data deliverables are due ten (10) work days prior to the Pre-fabrication design review and with final acceptance data package following acceptance testing of the manifold assemblies.

8.2 Drawings and Associated Lists

The Contractor shall provide four (4) hard copies of the as-built assembly drawings (CDRL 012) for each of the two manifold assemblies; Swing Arm Hydraulic Speed Control Manifold (KT00335) and Swing Arm Hydraulic Pressure Reduction Manifold (KT00336). The drawings shall include sub component part information, including a part breakdown list with part numbers. The drawings shall be provided ten (10) work days prior to the Pre-fabrication design review. Additionally, two (2) copies of these documents shall be submitted in an electronic format, on a disc or other transferable electronic media: one (1) copy in pdf and one (1) copy in native format, with native source program specified.

9.0 TEST PLANNING, PROCEDURES, AND REPORTING

The test plan and procedures (CDRL 013) for each manifold assembly shall be provided by the Contractor in separate documents, ten (10) work days prior to performance of testing and per the following:

9.1 Test plan information shall include the following as a minimum:

- A. Complete description of article under evaluation, including the description of the interface requirements between the article and the test facility (or apparatus).
- B. The overall approach, and objective for each test, including any special tailoring or interpretation of design and testing requirements.
- C. Detail descriptions of all test activities (i.e., tests, analyses, inspections) to be performed based on the identified requirements. Identify any prerequisites, constraints, and objectives for all the test activities.
- D. The contractor shall notify the NASA Contracting Officer ten (10) work days prior to the occurrence of a scheduled test (CDRL 014), which has been identified as a Mandatory Inspection Point (MIP).

9.2 Test procedures shall contain the following as a minimum:

- A. Identification of article being subjected to test, inspection, or demonstration.
- B. Identification of objectives established for the particular test, inspection, or demonstration.
- C. Description of steps and operations, in sequence, to be taken.
- D. Identification of measuring and recording equipment to be used, specifying range, accuracy, and type and any special instructions for operating such equipment.
- E. Layouts, schematics, or diagrams showing identification, location, and interconnection of item/article, support equipment, and measuring equipment.
- F. Environmental and/or other conditions to be maintained with tolerances.
- G. Constraints on test, inspection, or demonstration.
- H. Pass-fail criteria for evaluating results.
- I. Instructions for handling non-conformances and anomalous occurrences during activity.
- J. Confirmation that required support equipment has been calibrated and certification of the calibration is still valid.

- K. Identify testing steps which have been identified as a Mandatory Inspection Point (MIP).

9.3 Test Reports shall include the following as a minimum:

- A. Conclusions and recommendations relative to success of the test activity.
- B. Description of deviations from nominal results, failures, approved corrective actions and procedures, and retest.
- C. Traceability back to the requirement.
- D. Copy of as-run procedure (as appropriate).
- E. Identification of test configuration.
- F. Specific results of each procedure including automated test segments and associated analyses.
- G. The contractor shall provide test report data (CDRL 015) no later than five (5) work days upon completion of testing to the NASA Contracting Officer.

10.0 TECHNICAL KICKOFF AND DESIGN REVIEWS

The Contractor shall provide manpower, facilities, and data to support meetings and reviews defined in this SOW.

The Contractor will document and provide the NASA Contracting Officer the meeting minutes (CDRL 016) for review after the meeting. The minutes shall contain a description of the review with sufficient detail to enable the review decisions and comment disposition to be made a matter of record. The minutes shall include any presentation charts, a listing of disposition to comments, action items with actionee and suspense (closure) date. Minutes shall be provided within two (2) days to each attendee after the review meeting and an electronic copy shall be available.

Meetings defined below shall include as a minimum:

- A. Technical Kickoff Review
- B. Design Reviews

Except for the Technical Kickoff Review meeting, all other meetings shall when possible, be held via Telecom / WEBEX. If required due to technical reasons, if required face to face meetings will be held at the Contractor's facility.

10.1 Technical Kickoff Review

The Contractor shall conduct a Technical Kickoff Review with the government after contract award. This meeting will be held at KSC with contractor representatives and support parties present or tied in via Telecom / WEBEX. At a minimum this review should cover proposed basic high level concepts, and initial schedule for design and acceptance testing. This meeting will also serve as first technical exchange of Contractor engineering and NASA/ESC engineering for clarification of any specification technical items.

10.2 Design Reviews

10.2.1 Contractor Responsibilities

10.2.1.1 Agenda

The agenda (CDRL 017) shall specify the time and place for the scheduled review, specific review items and supporting documentation. The agenda shall be submitted to the NASA Contracting Officer for review, three (3) work days prior to the meeting.

10.2.1.2 Design Documents/ Review

The design documents (CDRL 018) shall be submitted to the NASA Contracting Officer ten (10) work days prior to the meeting, and as a minimum shall include the following items:

- A. Design Package Documentation (Drawings).

- B. All design analysis performed, that the unit was designed to.
- C. Final Shop production process procedures for items such as, but not limited to: records, NDE processes and individual certifications; cleaning processes and procedures; etc.
- D. After successful completion of this review and disposition of comments fabrication may begin.
- E. Component Specifications.

10.2.1.3 Design Comment Disposition

The Contractor shall perform all work necessary to prepare recommended technical options, solutions and dispositions to close each Design Comment that is within scope of the contract. Initial disposition shall be after closure of comment period. Comment disposition (CDRL 019) shall be completed and submitted to the NASA Contracting Officer Five (5) work days after closure of comment period. No review milestone shall be considered completed until all DC's deemed critical by the NASA Contracting Officer are closed. The NASA Contracting Officer shall track final closure of Design Comments associated with the design reviews. Formal Design Comments closure requires NASA Contracting Officer concurrence.

11.0 INTERCHANGEABILITY OF FINAL PRODUCTS

Manifold assemblies, components, and parts with the same part number shall be physically and functionally interchangeable.

12.0 PREPARATION FOR DELIVERY

The Contractor shall comply with standard commercial practice for packaging the manifolds for shipment. Each capped connection on the manifold assemblies shall be capped in accordance with KSC-C-123 and secured with an integrity seal such that any attempt to remove the cap would be indicated by a broken seal. Each Manifold Block Assembly shall be secured to a wooden pallet that will allow the assembly to be relocated via forklift. The units are to be packaged to provide protection during shipment to assure safe arrival at KSC in the stated clean condition.

All items shall be accompanied with Form DD250, "Material Inspection Receiving Report." Final acceptance shall be at the NASA destination.

Completed assemblies are to be weighed before shipment and the weight recorded within the shipping documents. Digital pictures of the final assembly ready for shipment from all angles showing all sides shall be taken and included in the ADP.

13.0 ADVANCE SHIPPING NOTICE

An Advanced Shipping Notice provides advance shipping information to the NASA Contracting Officer to coordinate the receipt of the shipped items with the NASA receiving, transportation, and management personnel. Complete shipping plan due ten (10) work days prior to each shipment. The Contractor shall furnish the following written information to the NASA Contracting Officer or his authorized designated representative, five (5) work days prior to each shipping notice:

- Date of Shipment
- Method of Shipment
- Complete or Partial Shipment
- Number of packages
- Dimensions of packages
- Total Weight

14.0 TRANSPORTATION

The Contractor is responsible for all fixtures, tie-downs, supports and any applicable permits required for shipping.

The Point of Acceptance will be Kennedy Space Center. The Contractor will ship to:

Transportation Officer, NASA
ISC Warehouse Building, M6-744
Kennedy Space Center, FL 32899

APPENDIX A: SUBMITTALS / CONTRACT DATA REQUIREMENT LIST (CDRL)

CDRL NO.	Section	Deliverables	Delivery Date
001	2.4	Manifold Drawings with Dimensions and Weight	Twenty (20) work days after Contract Award and with ADP
002	2.4	Engineering Analysis	Twenty (20) work days after Contract Award and with ADP
003	2.4	Technical Specifications and Requirements for Subcontractors	Ten (10) work days prior to providing to Subcontractor and with ADP
004	2.5	Warranty	With ADP
005	4.0	Project Schedule	Ten (10) work days after Contract Award
006	5.1	Deviation & Waiver Request	As needed, with full set of Deviation/Waiver Requests, both approved and disapproved with ADP
007	6.2	Inspection Control Point Outline and Record	Ten (10) days prior to start of fabrication and with ADP
008	6.3	Cleaning Procedure	Ten (10) work days prior to start of cleaning and with ADP
009	6.5	Certificate of Conformance – Raw Materials	With ADP
010	7.1	Acceptance Data Package (ADP) to included - Certificate of Compliance meeting the requirements stated in the Specification and Certificate of Compliance to ASME B31.3 Requirements	1 electronic copy ten (10) days before shipping the manifolds for review 1 updated electronic and 1 hard copy with shipment
011	8.1	Component Specifications	Ten (10) work days prior to Design Review and with ADP
012	8.2	Drawings and Associated Lists	Ten (10) work days prior to Design Review and with ADP
013	9.0	Test Plans & Procedures	Ten (10) work days prior to testing and with ADP
014	9.1	Test Notification	Ten (10) work days prior to test
015	9.3	Test Reports	Five (5) work days upon test completion and with ADP
016	10.0	Design Review Minutes	Two (2) work days after review and with ADP
017	10.2.1.1	Design Review Agenda	Three (3) work days prior to review
018	10.2.1.2	Design Review Document	Ten (10) work days prior to review and with ADP
019	10.2.1.3	Design Review Comment Disposition	Five (5) work days after closure of comment period and with ADP
020	13.0	Advance Shipping Notice	Five (5) work days prior to each shipment

Note – Days are defined as Calendar work days.